UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/746,618	12/21/2000	Kenneth R. Wilsher	M-8666 US	2164

7590 07/12/2004

Greg Dublin
Dorsey & Whitney, LLP
370 17th Street, Suite 4700
Denver, CO 80202

EXAMINER	
ROSENBERGER, RICHARD A	
ART UNIT	**PAPER NUMBER**
2877	

DATE MAILED: 07/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/746,618	WILSHER ET AL.	
	Examiner	Art Unit	
	Richard A Rosenberger	2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 April 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *11 and 12* is/are allowed.

6)☒ Claim(s) *1-10 and 13-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4/20/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-10 and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rao (US 5,812,708) and Paniccia (US 6,052,498).

Rao teaches directing light to photosensitive targets on an integrated circuit with a fiber and a lens (column 6, lines 30-38). As discussed in this section of the reference

> ...optics element 507 splits, collimates and focuses laser beams 509A-J into P-N junctions 515A-J using well known techniques. In one embodiment, optics element 507 includes a fiber optic system is employed to split the laser power and distribute and focus it into P-N junctions 515A-J. This embodiment includes individual micro-lenses at the ends of the fiber optic elements and any required matching of the silicon/air refractive index to maximize the light coupling into the silicon.

The optical pulses of Rao are disclosed as being clock pulses, and places the arrangement in the context of circuits with "clocks for the latching of data" (column 1, lines 16-17). Thus, fairly read, the reference thus at least clearly suggests using the clock pulses of the reference to latch data. The chip of Rao et al is at least obviously a useful chip, and thus it is at least obviously possible to read out the data latched into the chip since latching data into a chip without being able to access it later would render the latching of the

data into the chip useless for most, if not all, purposes. Further, it is noted that Paniccia, in a similar arrangement using optical signals, refers to his system as having an "input/output bus" and "input/output signals" (abstract, lines 1-3), which demonstrates that those in the art know that signals can be read out of, as well as into, integrated circuits.

Rao does not discuss how the optical fibers and lenses are held in place; it is clear, however, that there must be some sort of "fixture" so holding them, they do not float in air unsupported.

Rao mentions (column 6, lines 23-29) that there may be a heat sink included in the arrangement:

> In another embodiment of the present invention, optical element 507 is disposed between the silicon of substrate 513 and a heat sink (not shown). In that embodiment, optical element 507 is sandwiched between the silicon and the heat sink using well known techniques such that heat is sufficiently dissipated from the integrated circuit die.

It is known in the art that a heat sink may be combined with the "fixture" holding optical elements, This is shown by Paniccia (for example, the abstract, lines 6-9):

> An optical assembly used to generate and direct the light beams of the optical bus may be included within a heat sink thermally coupled to the back side silicon substrate of the integrated circuit die.

It would have been obvious to combine the heat sink mentioned by Rao and the fibers and lenses also taught by Rao in the manner taught by

Paniccia because this is a known manner of providing both elements taught by Rao in a convenient manner.

Both Rao (abstract, line 3) and Paniccia (column 7, lines 24) mention that the light source may be a laser.

Rao states that the optics can be implemented using "well known techniques" (column 6, line 32), and mentions computer-generated holograms (column 6, line 39) and lenses (column 6, line 36). The use of other known techniques or arrangements for focusing the light as desired, particularly given the teaching of Rao of using "well known techniques", would have been obvious.

It is known in the art that stray light is undesirable. It would have been obvious to provide means, such as blackening surfaces in the fixture, to capture unwanted stray light to reduce the art-recognized deleterious effects of such stray light, such as light reflected by the detector being illuminated.

3. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rao (US 5,812,708) and Paniccia (US 6,052,498) as applied to the claims above, and further in view of Waters et al (US 4,627,731) and Lackie (US 5,152,962).

It is know to focus light form a fiber onto a surface by means of a pair of lenses, the first of which collimates the light and the second of which focuses it; see Waters et al, figure 1, with the fiber with end 48 and two

lenses 56 and 58. Using this known arrangement to focus to light in a system such as taught by Rao would have been obvious because it is a known manner of focusing and directing light. Lackie shows that is it known in the art to use a tube to support an optical fiber for receiving light from a light source and/or transmitting light to a detector; see supporting tube 38. Using such a tube to support the fibers in an arrangement such as in Rao would have been obvious because it is a known manner to accomplish what is necessary, holding the fibers in place. As the fibers are not intended to move during use, it would have been at least obvious to hold the fiber "securely"; to do otherwise would have been foolish. The use of the tube does not in any way depend upon the details of the lens being used or other optical details of the arrangement shown by Lackie; the fiber will be supported equally as well should the light source be located at the other end of the fiber.

4. As set forth in the previous Office action, claims 11 and 12 are allowable for the reasons set forth in the previous office action.

5. The remarks filed 20 April 2004 have been considered.

As set forth above, it would have been at least clearly obvious to provide means to latch the data out of the circuit of Rao et al after it has been latched in by the optical pulses of that reference.

The remarks argue that the Rao reference "neither involves not suggests testing the device". The instant claims, while including "testing" in

the preamble as a non-limiting statement of intended use, are not limited to testing. As is well-known in the art, and as shown and suggested by Rao to those in the art, there are other known and obvious reasons to latch data into and read data out of an integrated circuit. The instant claims do not include means or steps to make the claims a test, such as analyzing the data after it has been read out to determine the functioning of the circuit. Thus this argument is not relevant to the claims now present in this case.

Similarly, the argument in the remarks that Paniccia also does not involve working with a device under test, such as testing integrated circuits, is not persuasive because it is not directed to what is actually being claimed.

The remarks argue that Lackie "does not provide support for the associated fiber". This is not correct. Lackie, column 5, lines 6-8 discloses that "one can form fiber 36, enclosure 38 and boss 46 as an integral whole as by molding or the like", and teaches that "the unitary assembly of fiber 36 and boss 46 is held firmly by assay apparatus 20" (column 8, lines 15-16).

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period

for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard A Rosenberger whose telephone number is (571) 272-2428. The examiner can normally be reached on Monday through Friday during the hours of 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

R. A. Rosenberger
9 July 2004

Richard A. Rosenberger
Primary Examiner